

In re Patent Application of:
ISAKSSON ET AL.
Serial No. 09/147,750
Filed: MAY 28, 1999

REMARKS

Applicants again thank the Examiner for the careful and thorough examination of the present application, and for the indication of allowable subject matter. By this amendment, various claims have been amended to eliminate minor informalities contained therein. Claims 1-32 and 36-45 remain pending in the application. Favorable reconsideration is respectfully requested.

I. The Invention

As described on pages 72-82 in reference to FIGS. 33-40, for example, the present invention relates to multi-carrier transmission systems that dynamically change carrier bit-loading and a method of synchronizing the updating of parameters relating to bit-loading. The receiver continuously measures and estimates the characteristics and changes of/in the channel. From this information, performance for each sub-channel (sub-wave) is identified. Then, on the basis of this information, reconfigurations of the transmitted number of bits per symbol for each single carrier wave are decided. To transmit this information, from a transmitter to a receiver, a special control channel is established. The control channel is primarily used for the exchange of channel information and bit allocation changes for carrier waves.

II. The Claims are Patentable

Claims 16 and 32 were rejected as allegedly being unclear for the reasons set forth on page 2 of the Office Action. Applicants direct the Examiner to pages 80 and 81 of the present specification, referring to FIG. 39, which clearly

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describe the relationship between the base synchronization interval (BSI) and the system transit time (Tsl). Claims 16 and 32 have also been amended to further clarify the meaning therein. Accordingly, Applicants believe that Claims 16 and 32 meet the statutory requirements of 35 U.S.C. §112.

Claims 1-7, 11-23, 27-32 and 36-45 were rejected in view of the Chow et al. patent (U.S. 5,479,447) in view of the Verbueken patent (U.S. 5,867,528) taken together or in various combinations with Chow (U.S. 6,064,692) or Tzannes et al. (U.S. 6,072,779) for the reasons set forth on pages 3-7 of the Office Action. Claims 8-10 and 24-26 were indicated as being directed to allowable subject matter. Applicants contend that Claims 1-7, 11-23, 27-32 and 36-45 clearly define over the cited references, and in view of the following remarks, favorable reconsideration of the rejections under 35 U.S.C. §103 is requested.

The Chow et al. patent (U.S. 5,479,447) is directed to a method and apparatus for adaptive, variable bandwidth, high-speed data transmission of a multicarrier signal over digital subscriber lines wherein the initial optimal transmission bandwidth is identified based on initial signal-to-noise ratio (SNR) estimates of the orthogonal carriers of the multicarrier system. The method includes the use of initial bit and energy allocation tables calculated at the receiver. Referring to Figs. 13 and 14 of Chow et al., these tables are stored in the receiver as the receive bit allocation table 78 and the receive energy allocation table 80, and these receiver tables are available to the data symbol decoder 72 during normal continuous system operation. These same tables are also communicated back

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to the transmitter and stored therein as the transmit bit allocation table 66 and the transmit energy allocation table 68, and these transmitter tables are available to the data symbol encoder 64 during normal continuous system operation. The Examiner further asserts that such bit allocation tables are inherently transmitted over a control channel.

The Verbueken patent (U.S. 5,867,528) is directed to a multi-carrier system, wherein the pilot carrier, or pilot tone, which is transmitted between two stations for tuning of sample timing, is re-allocated to a new frequency whenever it is disturbed by noise or a single frequency disturber in the vicinity thereof. The Examiner is maintaining that it would have been obvious to the skilled artisan to modify the method of Chow et al. with the frequency re-allocation feature of Verbueken.

Firstly, Applicants maintain that the Examiner has mis-characterized the teachings of the cited references. Specifically, Applicants note that Chow et al. is concerned with calculating the optimal transmission bandwidth during on-line system initialization, subject to an arbitrary transmit power mask and/or variable target bit error rates among the subchannels. Indeed, although the Chow et al. patent discusses the problems of signal-to-noise ratio and bit allocation, there is no discussion of a using a control channel for the exchange of bit allocation information for carrier waves at all.

Secondly, Applicants maintain that the Examiner is impermissibly using the teachings of Applicants' own patent application as a roadmap to modify the prior art. For example, as noted above, the method and apparatus of the Verbueken patent

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teaches the desire to re-allocate a pilot tone to a less noisy frequency with a pilot allocation device to ensure pilot tone quality. Thus, the modification of the system of Chow et al. in view of the teachings of Verbueken et al. would result in the use of a pilot allocation device in the apparatus of Chow et al. Again, there is no disclosure or teaching of using any control channels, much less multiple control channels, to transmit bit allocation information for carrier waves in any of the cited references.

As the Examiner is aware, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim features. The initial burden is on the Examiner to provide some suggestion of the desirability of doing what the Applicants have done. To support the conclusion that the claimed invention is directed to obvious subject matter, either the reference must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the reference. Both the suggestion to make the claimed combination and the reasonable expectation of success must be founded in the prior art and not in Applicants' disclosure.

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There is simply no teaching or suggestion in the cited references to provide the combination of features as claimed. Accordingly, for at least the reasons given above, Applicants maintain that the cited reference do not disclose or fairly suggest the invention as set forth in Claims 1, 17, 36 and 41. Furthermore, no proper modification of the teachings of these references could result in the invention as claimed. Thus, the rejections under 35 U.S.C. §103(a) should be withdrawn.

It is submitted that the independent claims are patentable over the prior art. In view of the patentability of the independent claims, it is submitted that their dependent claims, which recite yet further distinguishing features are also patentable over the cited references for at least the reasons set forth above. Accordingly, these dependent claims require no further discussion herein.

With respect to the Examiner's concern with Claims 36-45 under 37 CFR 1.75, Applicants point out that such claims are not substantial duplicates of Claims 1-5 and 17-22 and include more than a slight difference in wording.

How are they different?


III. Conclusion

In view of the foregoing remarks, it is respectfully submitted that the present application is in condition for allowance. An early notice thereof is earnestly solicited. If, after reviewing this Response, there are any remaining informalities which need to be resolved before the application can be passed to issue, the Examiner is invited and respectfully

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requested to contact the undersigned by telephone in order to
resolve such informalities.

Respectfully submitted,



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CERTIFICATE OF FACSIMILE TRANSMISSION

I HEREBY CERTIFY that the foregoing correspondence has been
forwarded via facsimile number 703-872-9314 to the Commissioner
for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 this 13
day of November, 2003.

